

BW Threat & Vulnerability

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BW Threat and Vulnerability

Briefing Outline

- BW Exploitation
- Area Coverage
- Threat Agents and Delivery Systems
- Differences between BW and CW
- Countermeasures



Biological Warfare Threat



“The one that scares me to death perhaps even more so than tactical nuclear weapons, the one we have less capability against, is biological weapons. And this was my greatest concern during Operation Desert Storm, knowing that the Iraqis had been working on such a capability.”

General Colin Powell

Chairman, JCS

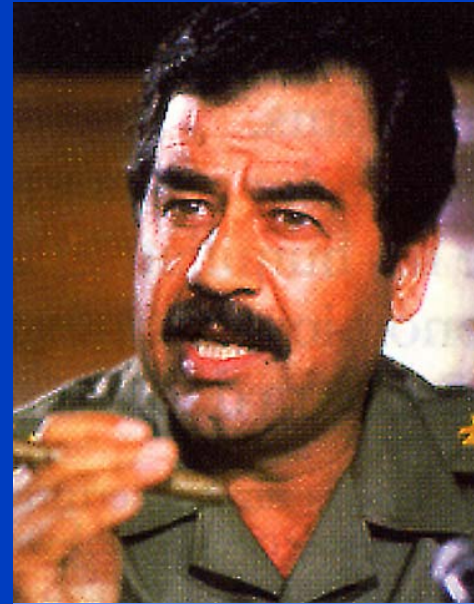
Testimony to House Armed Services Committee

30 March 1993

Biological Warfare Threats

Reasons to Exploit BW

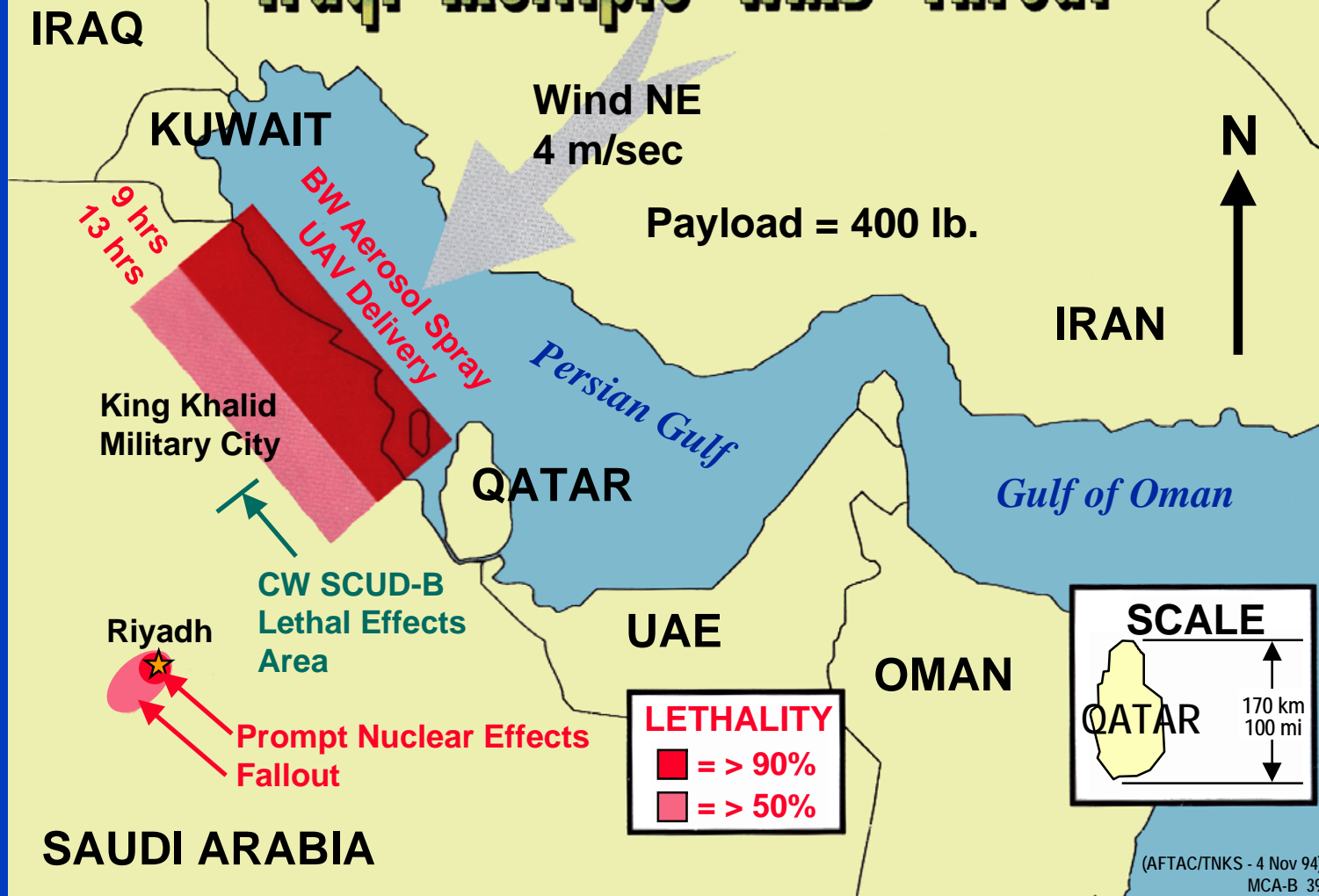
- Military options diminishing
- Formidable deterrence value
- U.S. vulnerable
- Massive casualties over huge area
- Plausible denial of use
- Cheap, available industrial base, easy to disseminate



Iraqi BW Threat

- Huge stockpile
- Weaponized
- Verified by UNSCOM

Iraqi Multiple WMD Threat



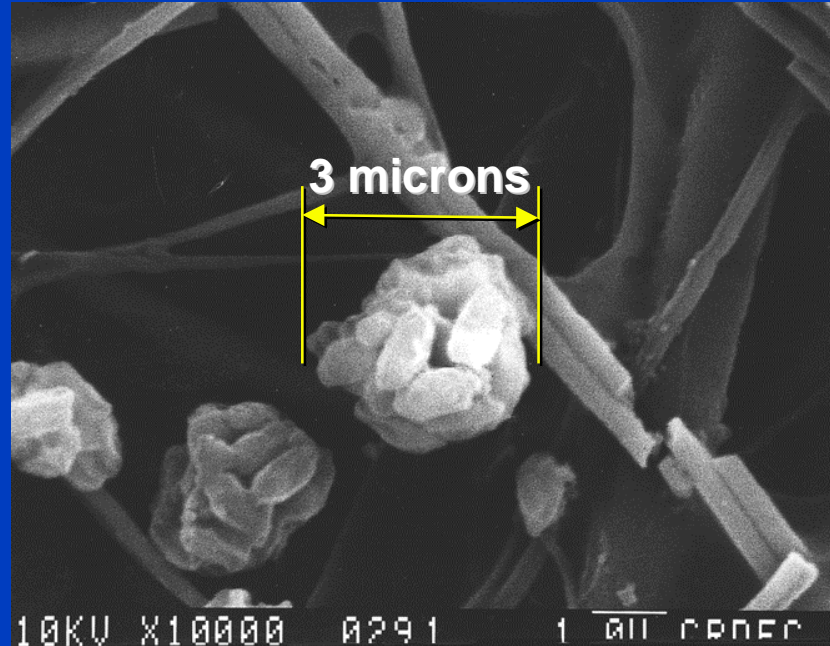
Threat List

Bacteria

- Anthrax
- Plague
- Tularemia
- Brucellosis

Toxins

- Botulism
- Ricin



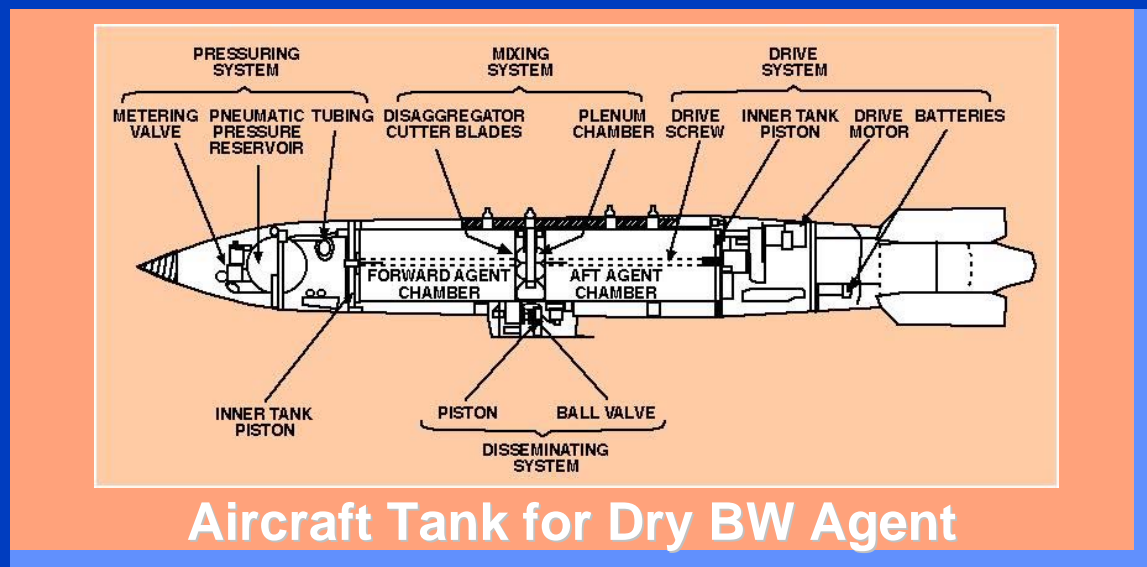
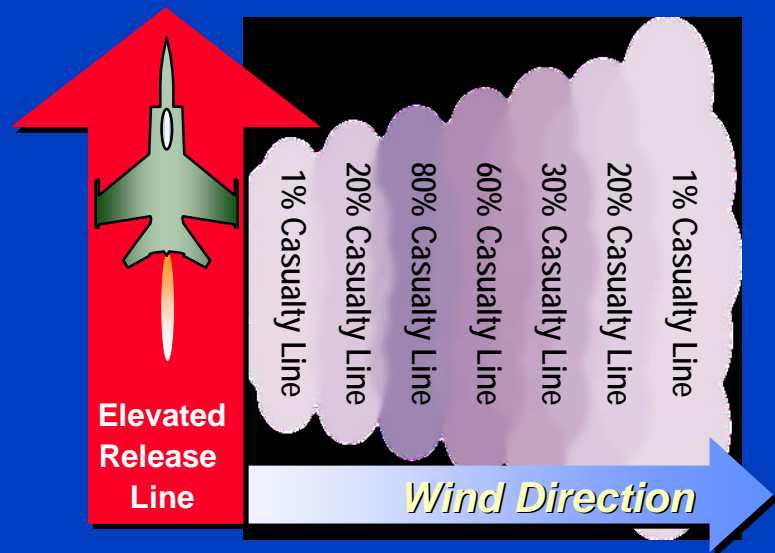
Viruses

- Smallpox
- Marburg
- Ebola
- Equine encephalitis

Enemy BW Delivery Systems

Spray Tanks Cruise Missiles

Low altitude,
line-source delivery
of wet or dry BW agents



Threat

- Large coverage area
- Very high dissemination efficiencies
- Cruise missiles difficult to intercept

BW Delivery Options



Agricultural sprayers

- Widely available
- Relatively inexpensive
- High dissemination efficiency

Iraqi exploitation

- Purchased several dozen just prior to Gulf War
- Delivery scenarios
 - Offshore dissemination
 - Pick-up truck



Enemy BW Delivery Systems



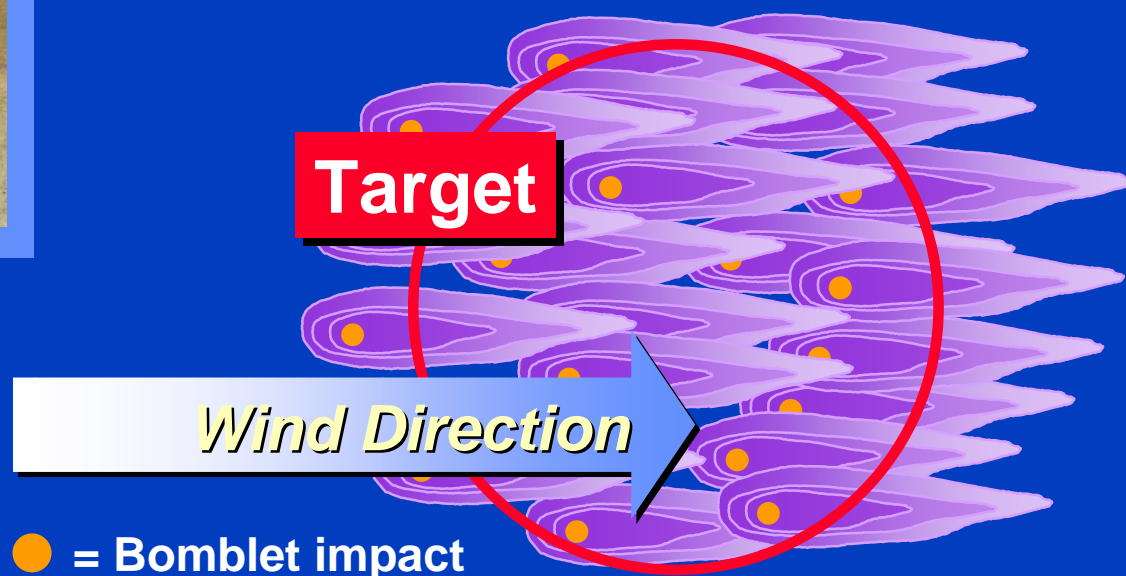
Missile Warhead with Bomblets

Coverage Area

SCUD-B with powdered anthrax = 50 sq. mi.

Threat

- Difficult to intercept
- On-target delivery of BW
- Theater or strategic weapon



Biological Threat in the Persian Gulf

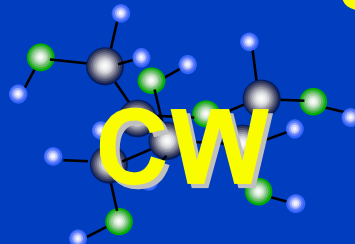
Favorable attack conditions

- Wind speed ≥ 4 mps
- Atmospheric inversion
- Wind from N or NE

Line-source dissemination
in January or February

Time	Wind Speed (mps)	% of Time	
		Inversion	Wind N-NE
2000-0200	3.2	100	13
0300-0900	3.5	86	9
1000-1400	4.5	45	18
1500-1900	4.6	79	20

Chemical vs. Biological Agents



Area coverage

< 10 km²

100's to 1000's km²

Quantity/km²

500 to 1000 kg

1 to 5 kg

Cost/km²

\$600

\$1

Onset time

Minutes (nerve agent)
to hours (mustard)

Days (anthrax) to
weeks (Q fever)

Agent form

Gas or liquid

Solid

Targets

Tactical

Rear area, theater,
strategic

US preparedness

Adequate

Inadequate

BW Force Protection

Summary

- Reasons for enemy to use BW are compelling
- Iraq had large, weaponized stockpile
- Delivery systems: simple to sophisticated
- Threat list is diversifying
- BW causes massive casualties over large areas
- BW completely different from CW
- Successful biodetection is strongest link in biodefense chain